

User Guide

SBV5222 SURFboard® Digital Voice Modem



Safety and Regulatory Information

IMPORTANT SAFETY INSTRUCTIONS - when using your telephone equipment, basic safety precautions should always be followed to reduce the risk of fire, electric shock, and injury to persons, including the following:

- Read all of the instructions listed here and/or in the user manual before you operate this device. Give particular attention to all safety precautions. Retain the instructions for future reference.
- This device must be installed and used in strict accordance with manufacturer's instructions as described in the user documentation that is included with the device.
- Comply with all warning and caution statements in the instructions. Observe all warning and caution symbols that are affixed to this device.
- To prevent fire or shock hazard, do not expose this device to rain or moisture. The device must not be exposed to dripping or splashing. Do not place objects filled with liquids, such as vases, on the device.
- This device was qualified under test conditions that included the use of the supplied cables between systems components. To ensure regulatory and safety compliance, use only the provided power and interface cables and install them properly.
- Different types of cord sets may be used for connections to the main supply circuit. Use only a main line cord that complies with all applicable device safety requirements of the country of use.
- Installation of this device must be in accordance with national wiring codes and conform to local regulations.
- Operate this device only from the type of power source indicated on the device's marking label. If you are not sure of the type of power supplied to your home, consult your dealer or local power company.
- Do not overload outlets or extension cords, as this can result in a risk of fire or electric shock. Overloaded AC outlets, extension cords, frayed power cords, damaged or cracked wire insulation, and broken plugs are dangerous. They may result in a shock or fire hazard.
- Route power supply cords so that they are not likely to be walked on or pinched by items placed upon or against them. Pay particular attention to cords where they are attached to plugs and convenience receptacles, and examine the point where they exit from the device.
- Place this device in a location that is close enough to an electrical outlet to accommodate the length of the power cord.
- It is recommended that the customer install an AC surge protector in the AC outlet to which this device is connected. This is to avoid damaging the device by local lightning strikes and other electrical surges.
- Postpone installation until there is no risk of thunderstorm or lightning activity in the area.
- Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning. For added protection for this device during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the cable system. This will prevent damage to the product due to lightning and power surges.
- Do not use this product near water for example, near a bathtub, washbowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool.
- Use only the power cord and batteries indicated in this manual. Do not dispose of batteries in a fire. They may explode. Check with local codes for possible special disposal instructions.

- Disconnect the TNV circuit connector before removing the cover.
- Disconnect TNV circuit connector(s) before disconnecting power.
- Do not use the telephone to report a gas leak in the vicinity of the leak.
- CAUTION: To reduce the risk of fire, use only No. 26 AWG or larger UL listed or CSA certified telecommunication line cord, or national equivalent.
- Do not cover the device, or block the airflow to the device with any other objects. Keep the device away from excessive heat and humidity and keep the device free from vibration and dust.
- Wipe the device with a clean, dry cloth. Never use cleaning fluid or similar chemicals. Do not spray cleaners directly on the device or use forced air to remove dust.
- Upon completion of any service or repairs to this device, ask the service technician to perform safety checks to determine that the device is in safe operating condition.
- Do not open the device. Do not perform any servicing other than that contained in the installation and troubleshooting instructions. Refer all servicing to qualified service personnel.

SAVE THESE INSTRUCTIONS

Note to CATV System Installer - This reminder is provided to call the CATV system installer's attention to Section 820-93 of the National Electric Code, which provides guidelines for proper grounding and, in particular, specifies that the Coaxial cable shield shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Caring for the Environment by Recycling



When you see this symbol on a Motorola product, do not dispose of the product with residential or commercial waste.

Recycling your Motorola Equipment

Please do not dispose of this product with your residential or commercial waste. Some countries or regions, such as the European Union, have set up systems to collect and recycle electrical and electronic waste items. Contact your local authorities for information about practices established for your region. If collection systems are not available, call Motorola Customer Service for assistance.

Safety Requirements for the SBV5222 Lithium-Ion Battery

You must properly handle the SBV5222 lithium-ion rechargeable battery to ensure your safety. Improper handling can cause leakage, heat, smoke, explosion, or fire resulting in damage to the equipment or the user.

- Use the SBV5222 battery only in the SBV5222 Digital Voice Modem.
- CAUTION: Risk of explosion if battery is replaced by the incorrect type. Use only Motorola approved batteries, Motorola part number 515757-001 and 538043-001. Dispose of used batteries according to the instructions.
- Do not use the battery where static electricity is generated.
- Do not heat the battery or discard into a fire. Keep the battery away from high-temperature locations.
- Properly discard the battery if it exhibits an abnormal condition, such as heat, odor, color, or a change in shape. When discarding, place insulated tape over the battery terminals.
- The battery should be stored out of the reach of children.
- Do not store the battery close to metal objects.
- If the battery leaks fluid and you touch it, immediately wash your hands. If the fluid gets into your eye, do not rub the eye. Rinse with water and immediately seek medical care. Left untreated, the battery fluid could cause damage to the eye.
- Ensure that the battery does not receive any strong impacts, such as dropping or striking with a hard object.
- At the end of battery life, the SBV5222 battery must be disposed of properly and may need to be recycled. Contact your local recycling center for proper disposal methods.
- Do not expose the battery to ultrasonic energy.
- Do not disassemble, modify, or attempt to repair the battery.
- Before installation, the battery should not be subjected to temperatures below -10°C or above +60°C (14° F to 140° F). After initial customer usage (initially charged above shipping charge state), the battery should not be subjected to temperatures outside the operating temperature range:
 - Battery Pack External Exposure Operating Temperature Range:
 - Charging: 0.0°C to +45.0°C (0° F to 113° F)
 - Discharging: -10.0°C to +60.0°C (14° F to 140° F)

Important VoIP Service Information



When using this VoIP device, you CANNOT make any calls, including an emergency call, and emergency location services (where supported) WILL NOT be available, under the following circumstances:

- Your broadband ISP connection goes down, is lost, or otherwise fails.
- You lose electrical power.
- You have changed the physical address of your VoIP device, and you did not update or otherwise advise your VoIP service provider of this change.
- There are delays in making your location information available in or through the local automatic location information database.

Note: Your service provider, not Motorola, is responsible for the provision of VoIP telephony services through this equipment. Motorola shall not be liable for, and expressly disclaims, any direct or indirect liabilities, damages, losses, claims, demands, actions, causes of action, risks or harms arising from or related to the services provided through this equipment.

Regulatory Information

FCC Compliance Class B Digital Device

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Canada - Industry Canada (IC)

This Class B digital device complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

FCC Declaration of Conformity

According to 47CFR, Parts 2 and 15 for Class B Personal Computers and Peripherals; and/or CPU Boards and Power Supplies used with Class B Personal Computers, Motorola, Inc. Connected Home Solutions Business, 101 Tournament Drive, Horsham, PA 19044, 1-215-323-1000, declares under sole responsibility that the product identifies with 47CFR Part 2 and 15 of the FCC Rules as a Class B digital device. Each product marketed is identical to the representative unit tested and found to be compliant with the standards. Records maintained continue to reflect the equipment being produced can be expected to be within the variation accepted, due to quantity production and testing on a statistical basis as required by 47CFR 2.909. The above named party is responsible for ensuring that the equipment complies with the standards of 47CFR, Paragraph 15.101 to 15.109.

International Declaration of Conformity

We,

Motorola, Inc.
Connected Home Solutions Business
101 Tournament Drive
Horsham, PA, U.S.A.

declare under our sole responsibility that the

SBV5222

to which the declaration relates is in conformity with one or more of the following standards:

EN55022	EN55024	EN60950-1	EN61000-3-2	EN61000-3-3
CISPR 22	CISPR 24	IEC 60950-1	ETSI EN 300386	

the following provisions of the Directive(s) of the Council of the European Union:

EMC Directive 89/336/EEC
Directive 93/68/EEC
Low Voltage Directive 2006/95/EC
Restriction of the Use of Certain Hazardous Substances in Electrical Equipment (RoHS) Directive 2005/95/EC

Models

SBV5222, SBV5222 Diagnostic

SBV5222i, SBV5222 Diagnostic

Standards

FCC Part 15, ICES-003
UL60950-1, CAN/CSA-C22.2 No. 60950-1

EN55022, EN55024, CISPR22, CISPR24,
EN61000-3-2, EN61000-3-3, EN60950-1, IEC60950-1,
ETSI EN 300386

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► Introduction

Congratulations on your new Motorola SBV5222 SURFboard Digital Voice Cable Modem! The SBV5222 provides high-speed access to the Internet and other online services, and VoIP connections for up to two telephone lines.

SBV5222 Digital Voice Modem

Your SBV5222 digital voice modem transmits and receives data much faster than traditional dial-up or DSL (digital subscriber line) modems. It lets you enjoy surfing the Web without the long wait. Because many network and other factors can affect performance, the actual speed will vary.

Unlike a dial-up modem, your SURFboard Digital Voice Modem is always online. Just open your browser and surf! You can use your high-speed, upgradeable digital voice modem to connect one or more computers in your home or business to the Internet. You can connect:

- A single computer equipped with a Universal Serial Bus ([USB](#)) port directly to the USB port on the SURFboard Digital Voice Modem
- A single computer equipped with an [Ethernet](#) adapter directly to the Ethernet port on the SURFboard Digital Voice Modem
- Two computers, one to the USB port and one to the Ethernet port
- Up to 31 computers to a single SURFboard Digital Voice Modem using an Ethernet hub, as shown in "[Cabling for Multiple Users](#)" on page 27

For easiest set-up, use the Installation Assistant on the SURFboard Voice Modem CD-ROM.

SBV5222 VoIP Telephone Service

The SBV5222 also provides telephone service through your cable connection with the same features as your traditional phone service, including standby power with an integrated battery backup in the event that you lose AC power. You can connect up to two standard telephone lines using your SURFboard Digital Voice Modem, supporting:

- Local and long-distance calling
- Standby power support for a minimum of eight hours standby or five hours talk time
- Standard telephone feature support. For a full listing, see "[Telephone Features Supported by the SBV5222](#)" on page 2.
- Telephone modem and fax support
- HTML diagnostic page
- Software upgrades over the network to provide new or improved services

Caution



Use only a standard telephone. Digital phones used in many businesses that connect to a [PBX](#) (private branch exchange) do not operate with the SBV5222.

Telephone Features Supported by the SBV5222

The SBV5222 supports the telephone features listed below. Some features listed may not be available on your telephone. Feature availability may also be determined by your telephone service provider.

- Standard two-wire telephone connection for voice, fax, and telephone modem operation. The connection to the telephone equipment is made with a standard RJ-11 jack and plug.
- Re-dial number
- Speed dial
- Call forwarding
- Call hold and mute
- Call return
- Call waiting
- Caller ID
- Caller ID block
- Three-way calling
- Voice mail
- Telephony Devices for the Disabled (TDD)
- On hook, off hook detection
- Operator barge-in
- Standard call progress signals
- Dial-tone stutter
- Dial-tone busy
- Fast-busy stutter dial-tone call waiting
- No support for pulse-dial equipment

Top and Front Panel

The model number on your digital voice modem may be different than in the illustrations and screen images in this guide.



The lights provide information about power, communications, and errors:

Key	Light	Flashing	On
1	Power	Startup diagnostics in progress.	digital voice modem powered on.
2	DS (downstream)	Scanning for a receive (downstream) channel connection.	Downstream channel connected.
3	US (upstream)	Scanning for a send (upstream) channel connection.	Upstream channel connected.
4	Online	Scanning for a network connection.	Startup process completed.
5	Link	Transmitting or receiving data.	A device, such as a computer or hub, is connected to the USB or Ethernet connectors on the back panel.
6	Tel 1	Connected and activated, telephone is off-hook (in use).	Connected and activated, the telephone is on-hook (not in use).
7	Tel 2	Connected and activated, telephone is off-hook (in use).	Connected and activated, the telephone is on-hook (not in use).
8	Battery	AC power not present.	Normal condition indicating that AC power present and the battery is in good condition.

During normal operation, the Power, DS, US, and Online lights are on and the Link light flashes when the digital voice modem is transferring data.

Rear Panel



The rear panel provides cabling connectors and the power receptacle:

Key	Item	Description
1 & 2	Tel 1 and Tel 2	Telephone ports 1 and 2 provide connections for two telephone lines.
3	POWER	Provides AC power to the digital voice modem.
4	ETHERNET	Provides the connection to Ethernet equipped computers using a cable terminated with an RJ-45 connector.
5	USB	Provides the connection to USB equipped computers.
6	Reset	If you experience a problem, you can push this recessed button to reset the digital voice modem (see " Troubleshooting " on page 32). Resetting may take some time (5 to 30 minutes) because the digital voice modem must find and lock on the appropriate communications channels.
7	CABLE	Provides the connection to the coaxial cable (coax) outlet.

Before You Begin

Verify that you have the items pictured below.

Item	Description
Power adapter or cable	 Connects to the AC power outlet
10/100Base-T Ethernet cable	 Connects to the Ethernet port
Phone wire	 Connects the telephone to the cable system to provide telephone service

Optional Items

Your package contents may vary depending on your model

USB cable	 Connects to the USB port
SURFboard Voice Modem CD-ROM	 Contains the User Guide and USB drivers
Battery	 Provides standby power for your SBV5222 (one each). The SBV5222 has the capability to accommodate two standby batteries. For additional standby batteries, contact your service provider.

You will need 75-ohm coaxial cable with [F-type connectors](#) to connect your digital voice modem to the nearest cable outlet. If a TV is connected to the cable outlet, you may need a 5–900 MHz RF [splitter](#) and a total of three coaxial cables to connect both the TV and the digital voice modem. The coaxial cable and RF splitter are available at consumer electronics stores. To connect your digital voice modem to an Ethernet hub, see the network description in ["Cabling for Multiple Users"](#) on page 27. Check the documentation provided with your hub.

Caution



This product is for indoor use only. Do not route the USB, Ethernet, or telephone cables outside of the building. Exposure of the cables to lightning could create a safety hazard and damage the product.

Precautions

Postpone digital voice modem installation until there is no risk of thunderstorm or lightning activity in the area.

To avoid damaging the digital voice modem with static electricity:

- Always first connect the coaxial cable to the grounded cable TV wall outlet.
- Before you connect or disconnect the USB or Ethernet cable from your digital voice modem or PC, always touch the coaxial cable connector on the digital voice modem to release any static charges.

To avoid damaging your digital voice modem or PC with static electricity:



To prevent overheating the digital voice modem, do not block the ventilation holes.

Do not open the digital voice modem. Refer all service to your cable provider.

Wipe the digital voice modem with a clean, dry cloth. Never use cleaning fluid or similar chemicals. Do not spray cleaners directly on the unit or use forced air to remove dust.

Caution



Contact your cable provider before connecting your digital voice modem to your existing telephone wiring.
Do not connect the telephone wire to a traditional telephone ([PSTN](#)) service.

Signing Up for Service

You must sign up with a cable provider to access the Internet and other online services.

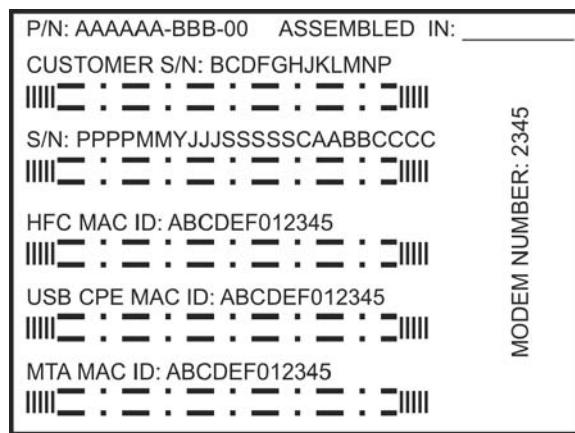
To activate your service, call your local cable provider.

*To receive data service, you need to provide the **MAC address** printed on the bar code label marked **HFC MAC ID** on the back of the cable modem. You can record it here:*

00 : _____ : _____ : _____ : _____ : _____

*To receive telephone service, you need to provide the **MAC address** printed on the bar code label marked **MTA MAC ID** on the back of the cable modem. You can record it here:*

00 : _____ : _____ : _____ : _____ : _____



You should ask your cable provider the following questions:

- Do you have any special system requirements?
- When can I begin to use my digital voice modem?
- Are there any files I need to [download](#) after I am connected?
- Do I need a user name or password to access the Internet or use e-mail?

Computer System Requirements

You can use any Web browser, such as Microsoft® Internet Explorer or Netscape Navigator®, with your SURFboard Digital Voice Modem.

For Microsoft Windows computers, the Installation Assistant application automatically checks your system configuration. You can start the Installation Assistant from the Main Menu on the *SURFboard Voice Modem* CD-ROM.

You must have the latest version of your operating system installed with all current service packs and patches.

Ethernet Card

You can use the Ethernet connection with any Windows, Macintosh, UNIX, or Linux computer equipped with a 10Base-T or 10/100Base-T Ethernet card.

The original version of Windows® 98, Windows® NT, UNIX, Linux, or Macintosh computers must use the Ethernet connection.

If you use an Ethernet card, it must be installed in your computer before you install your SBV5222 digital voice modem. If it is not installed, follow the installation instructions provided with your Ethernet card.

USB Connection

You can use the USB connection with any PC running Windows® 2000 or Windows XP™ that has a USB interface.

You can upgrade your USB drivers from our [Downloads](http://broadband.motorola.com/noflash/usb_drivers.asp) page http://broadband.motorola.com/noflash/usb_drivers.asp.

For user with Microsoft Vista™, please note the following information on driver support:

Vista OS support

Vista Home Basic (32 bit and 64 bit)

Vista Home Premium (32 bit and 64 bit)

Vista Business (32 bit and 64 bit)

Vista Ultimate (32 bit and 64 bit)

and the Euro market versions without Window Media Player

Vista nHome Basic (32 bit and 64 bit)

Vista nHome Premium (32 bit and 64 bit)

Vista nBusiness (32 bit and 64 bit)

Vista nUltimate (32 bit and 64 bit)

► Battery Installation

Before you begin the installation, you must first install the battery in your digital voice modem. Please read “[Safety Requirements for the SBV5222 Lithium-Ion Battery](#)” on page iv before proceeding.

- 1 Place the SBV5222 on its side and remove the battery cover on the bottom.

Battery Installation



- 2 Slide the battery into the battery compartment until it is fully seated. The battery is keyed so that it cannot be installed incorrectly. Make sure that the pull-tab on the battery is accessible and does not prevent the battery cover from closing properly.
- 3 Re-install the battery cover with the locking tabs seated downward, and then push the cover forward.

It may take up to 12 hours to reach full charge when:

- The battery is installed for the first time.
- The battery is replaced.
- The battery is fully discharged.

Installation and Configuration

To install and configure your digital voice modem for a single PC running Microsoft Windows, we recommend using the Installation Assistant. You can start the Installation Assistant from the Main Menu on the *SURFboard Voice Modem* CD-ROM. In most cases, the Installation Assistant automatically configures your digital voice modem.

Otherwise, to install and configure your digital voice modem:

- 1 Connect the cables as described for your situation:
 - “[Cabling and Startup for a Single User](#)” on page 10
 - “[Cabling for Multiple Users](#)” on page 27
- 2 If you are using the [USB](#) port *only*, go to “[Setting Up a USB Driver](#)” on page 12. *Ethernet users can skip this step.*
- 3 Configure [TCP/IP](#) and verify the [IP address](#) for your computer as described for your situation:
 - For Windows computers, see “[Configuring TCP/IP](#)” on page 17.
 - Refer to your Macintosh or UNIX user manual for information regarding TCP/IP and IP address configuration.

Cabling and Startup for a Single User

Allow some time (5 to 30 minutes) to power up the first time because the SURFboard Digital Voice Modem must find and lock on the appropriate channels for communications.



- 1 Be sure your computer is on and the digital voice modem is unplugged.
- 2 Connect one end of the coaxial cable to the cable outlet or splitter. Connect the other end of the coaxial cable to the CABLE connector on the digital voice modem. *Hand-tighten the connectors to avoid damaging them.*
- 3 Insert the *SURFboard Voice Modem* CD-ROM into your CD-ROM drive.
- 4 Plug the AC power cord into the connector on the digital voice modem and an unswitched AC electrical outlet. This turns on the SURFboard Digital Voice Modem. You do not need to unplug it when not in use.

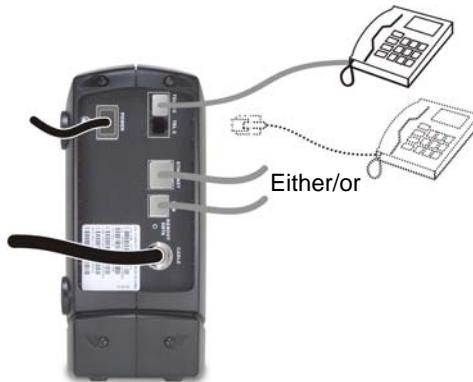
- 5 Check that the lights on the front of the digital voice modem cycle through this sequence:
 - Power flashes during the self-test and changes to solid green when the self-test is successfully complete.
 - Receive flashes while scanning for the receive ([downstream](#)) channel and changes to solid green when it is connected.
 - Send flashes while scanning for the send ([upstream](#)) channel and changes to solid green when it is connected.
 - Online flashes while the digital voice modem downloads configuration data and changes to solid green when the download is complete.
- 6 Connect your computer to the digital voice modem using USB or Ethernet:



USB: Be sure the SURFboard Voice Modem CD-ROM is inserted in your CD-ROM drive. Perform the appropriate procedure for [Setting Up a USB Driver](#) for your Windows version. Connect the USB cable to the USB port on the digital voice modem. Connect the other end to the USB port on your PC.

Ethernet: Connect the provided straight-through Ethernet cable to the Ethernet connector on the digital voice modem. Connect the other end to the Ethernet port on your computer. *Ethernet users do not need to set up USB.*

- 7 Perform the procedures for "Configuring TCP/IP" on page 17.
- 8 To connect the telephone line, plug a phone wire into the Tel 1 connector. You can also connect a second telephone line to the Tel 2 connector if your provider has enabled a second line.



Caution!



To reduce the risk of fire, use only No. 26 or larger UL Listed or CSA Certified Telecommunication Line Cord or national equivalent to connect a telephone line to your SURFboard Digital Voice Modem. Do not connect *both* the Ethernet and USB cables to the same computer. Connect to either Ethernet or USB. Contact your cable provider before connecting your digital voice modem to your existing telephone wiring. Do not connect the telephone wire to a traditional telephone ([PSTN](#)) service. Be sure the phone connectors are neither connected together nor connected to wall jacks on the same network.

Setting Up a USB Driver

The following subsections describe setting up a USB driver. Before connecting a PC to the USB port, perform the appropriate procedure for your Windows version:

- "Setting Up a USB Driver in Windows 2000" on page 13
- "Setting Up a USB Driver in Windows XP" on page 16

When you finish setting up the USB driver, you can continue with "Configuring TCP/IP" on page 17.

The SURFboard Digital Voice Modem USB driver does not support Macintosh or UNIX computers. For those systems, you can connect through Ethernet *only*.

Caution!



Be sure the SURFboard Voice Modem CD-ROM is inserted in the CD-ROM drive before you plug in the USB cable.

Setting Up a USB Driver in Windows 2000

- 1 *Insert the SURFboard Voice Modem CD-ROM in the CD-ROM drive.* This CD contains the USB drivers and must be inserted and read by the PC before you connect the digital voice modem to the PC.
- 2 Connect the digital voice modem to your computer with a USB cable. For further instructions, see "[Cabling and Startup for a Single User](#)" on page 10. A few seconds after you complete the USB connection, the Found New Hardware Wizard window is displayed:



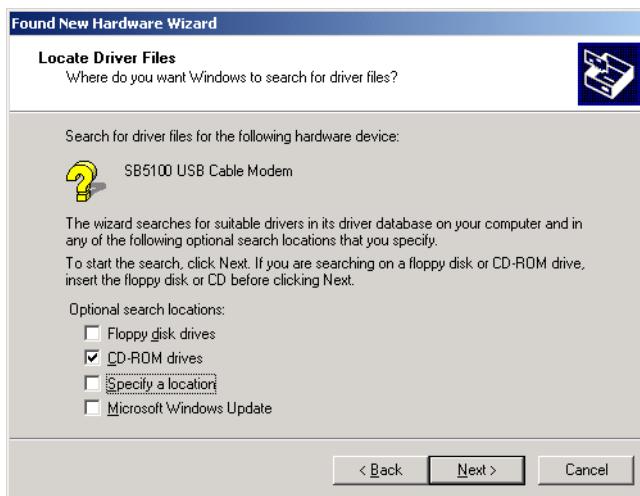
- 3 Click **Next**. The following window is displayed:



Although your digital voice modem model number may be different than in the images in this guide, the procedure is the same.

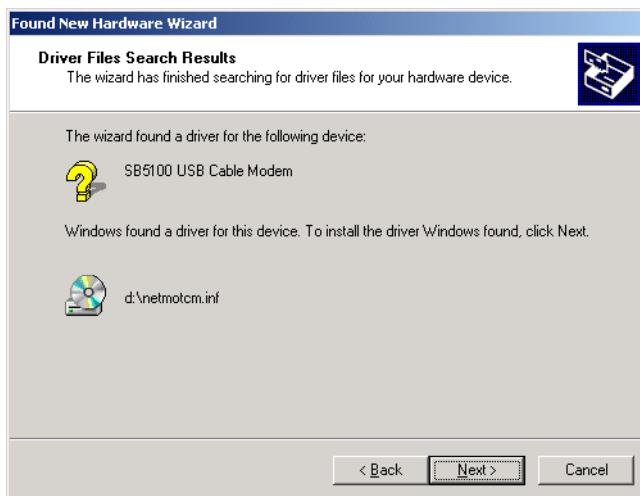
Be sure "Search for a suitable driver for my device" is selected.

- 4 Click **Next**. The following window is displayed:



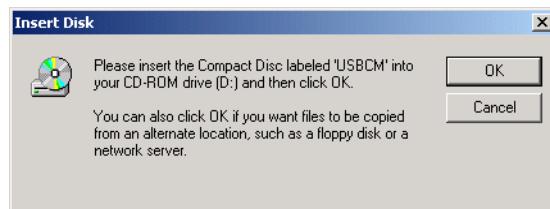
Be sure "CD-ROM drives" is the only box selected.

- 5 Click **Next**. The following window is displayed:

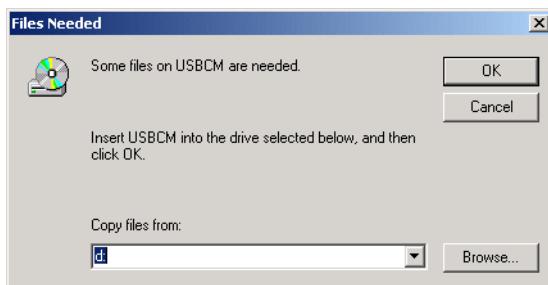


- 6 Click **Next**.

If the Insert Disk window is displayed, be sure the *SURFboard Voice Modem* CD-ROM is in the CD-ROM drive and follow steps 7 to 11. Otherwise, if the Completing the Found New Hardware window is displayed, you can skip to step 12.



- 7 On the Insert Disk window, click **OK**. The Files Needed window is displayed:



- 8 If necessary, select your CD-ROM drive in the “**Copy files from**” list.
9 Click **Browse**.
10 Double-click the **NetMotCM.sys** file in the CD-ROM root directory. The Files Needed window is displayed:
11 Click **OK**. The Found New Hardware Wizard window is displayed:



- 12 Click **Finish** to complete the installation.

When you finish setting up the USB driver, you can continue with “Configuring TCP/IP in Windows 2000” on page 17.

If you have any difficulties setting up the USB driver, perform “[Removing the USB Driver from Windows 2000](#)” on page 34 and repeat this procedure.

Setting Up a USB Driver in Windows XP

- 1 Insert the *SURFboard Voice Modem CD-ROM* in the CD-ROM drive. This CD contains the USB drivers and must be inserted and read by the PC before you connect the digital voice modem to the PC.
- 2 Connect the digital voice modem to your computer with a USB cable. For further instructions, see "[Cabling and Startup for a Single User](#)" on page 10. A few seconds after you complete the USB connection, the Found New Hardware Wizard window is displayed:



- 3 Be sure "Install the software automatically" is selected.
- 4 Click **Next**. Windows automatically searches for the correct USB drivers and installs them. If the installation is successful, the following window is displayed:



Although your digital voice modem model number may be different than in the images in this guide, the procedure is the same.

- 5 Click **Finish** to complete the installation. Otherwise, be sure the *SURFboard Voice Modem CD-ROM* is correctly inserted in your CD-ROM drive.

When you finish setting up the USB driver, you can continue with "[Configuring TCP/IP in Windows XP](#)" on page 21.

Configuring TCP/IP

The SURFboard Digital Voice Modem contains all required software. You do not need to configure the digital voice modem, but you must be sure that your computer is configured for [TCP/IP](#) (a protocol for communication between computers). Perform one of the following:

- “Configuring TCP/IP in Windows 2000” on page 17
- “Configuring TCP/IP in Windows XP” on page 21
- **Windows Vista users, to obtain the TCP/IP configuration and verification, please consult help system.**

- Follow the instructions in your Macintosh or UNIX user manual

After configuring TCP/IP, perform one of the following to verify the [IP address](#):

- “Verifying the IP Address in Windows 2000 or Windows XP” on page 25
- Follow the instructions in your Macintosh or UNIX user manual

Your cable provider may provide additional instructions to set up your computer.

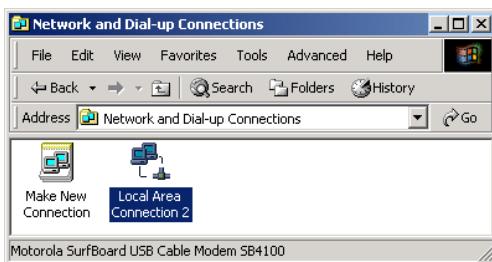
Configuring TCP/IP in Windows 2000

- 1 On the Windows Desktop, click **Start**.
- 2 Select **Settings** and then **Control Panel** from the pop-up menus. The Control Panel window is displayed:

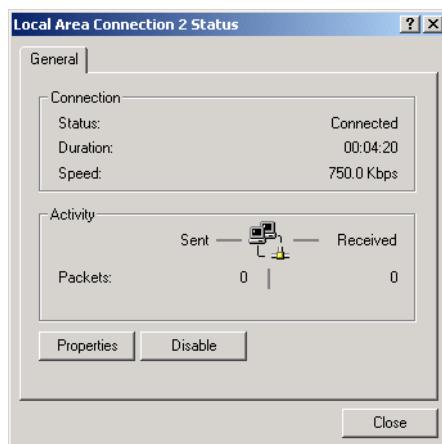


In the steps that follow, a connection *number* such as 1, 2, or 3 is a reference displayed on PCs with multiple network interfaces. PCs having only one network interface may display only the label Local Area Connection.

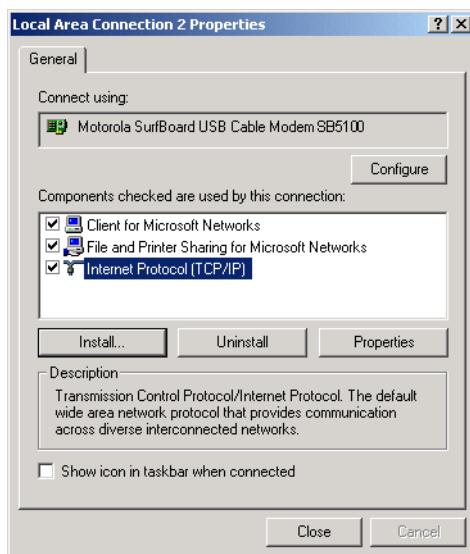
- 3 Double-click the **Network and Dial-up Connections** icon on the Control Panel window. The Network and Dial-up Connections window is displayed:



- 4 Double-click **Local Area Connection number**. The value of *number* varies from system to system. The Local Area Connection *number* Status window is displayed:

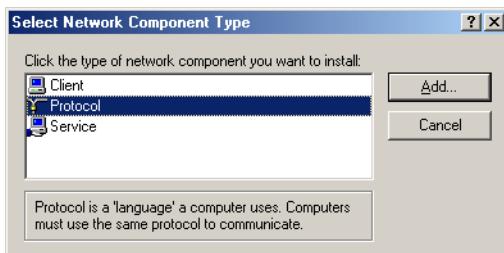


- 5 Click **Properties**. The Local Area Connection Properties window is displayed:

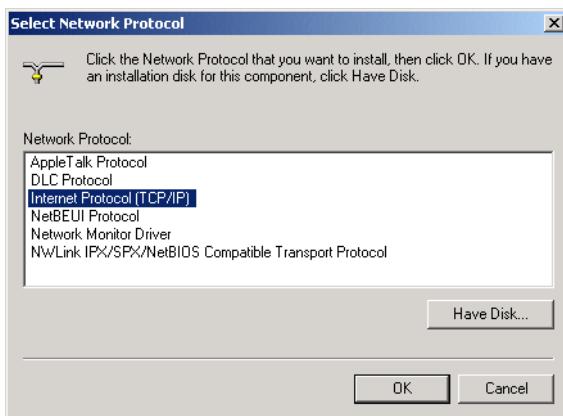


- 6 If Internet Protocol (TCP/IP) is in the list of components, TCP/IP is installed. You can skip to step 10.

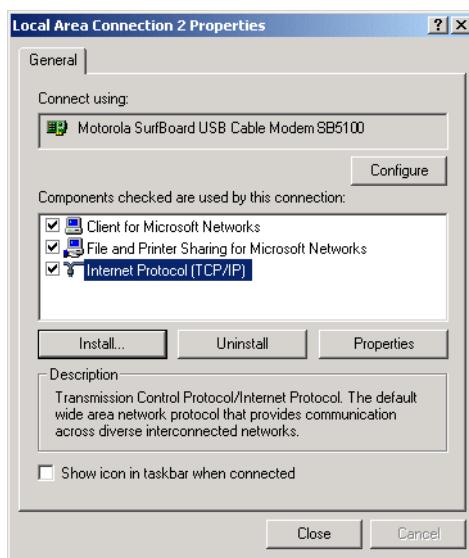
If Internet Protocol (TCP/IP) is not in the list, click **Install**. The Select Network Component Type window is displayed:



- 7 Click **Protocol** on the Select Network Component Type window and click **Add**. The Select Network Protocol window is displayed:

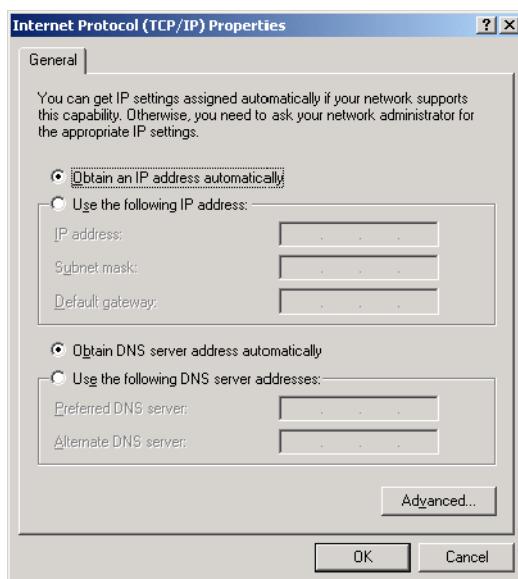


- 8 Click **Internet Protocol (TCP/IP)** in the Network Protocol section on the Select Network Protocol window.
- 9 Click **OK**. The Local Area Connection *number* Properties window is re-displayed:



- 10 On the Local Area Connection *number* Properties window, be sure the box next to **Internet Protocol (TCP/IP)** is selected.

- 11 Click **Properties**. The Internet Protocol (TCP/IP) Properties window is displayed:



12 Be sure **Obtain IP address automatically** and **Obtain DNS server address automatically** are selected. Click **OK** to accept the TCP/IP settings.

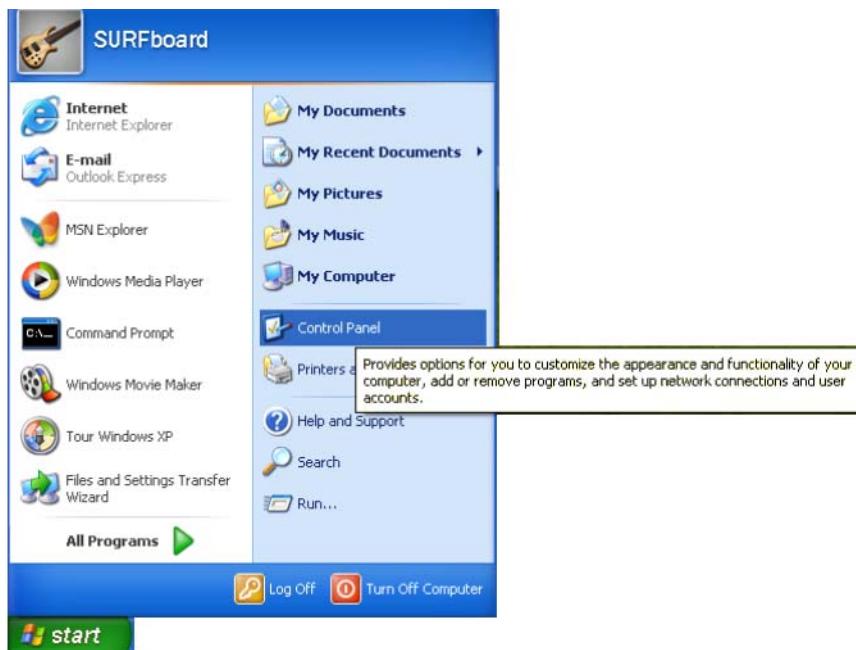
13 Click **OK** to close the Local Area Connection *number* Properties window.

14 Click **OK** when prompted to restart your computer and click **OK** again.

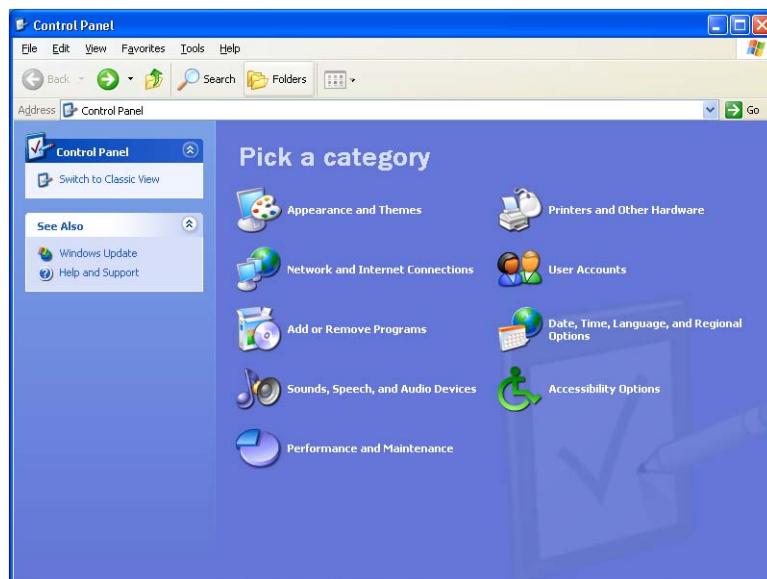
When you complete the TCP/IP configuration, go to "[Verifying the IP Address in Windows 2000 or Windows XP](#)" on page 25.

Configuring TCP/IP in Windows XP

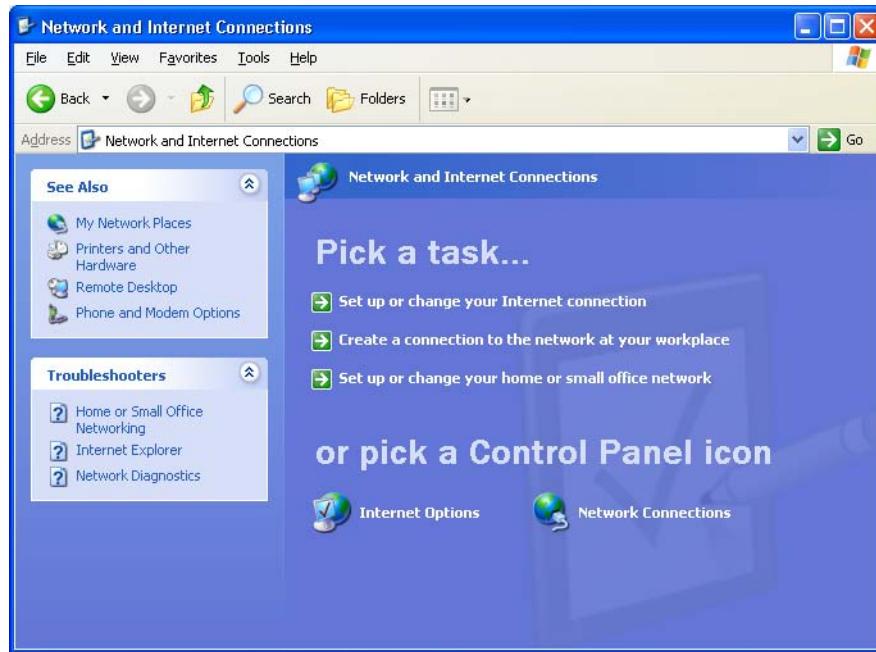
- 1 On the Windows desktop, click **Start** to display the Start window shown.



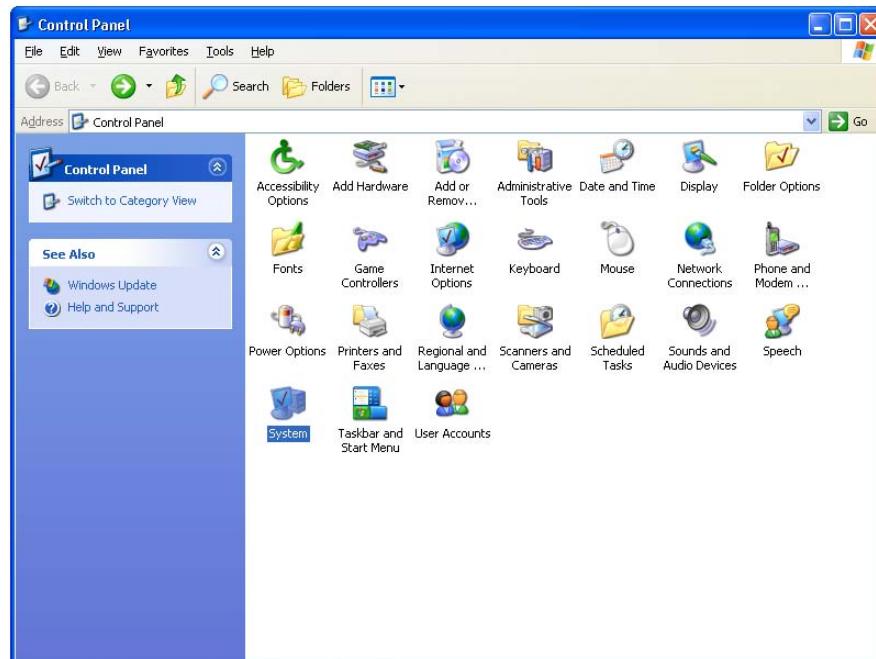
- 2 Click **Control Panel** to display the Control Panel window. The display varies, depending on your Windows XP view options. If the display is a *Category* view as shown below, continue with step 3. Otherwise, skip to step 5.



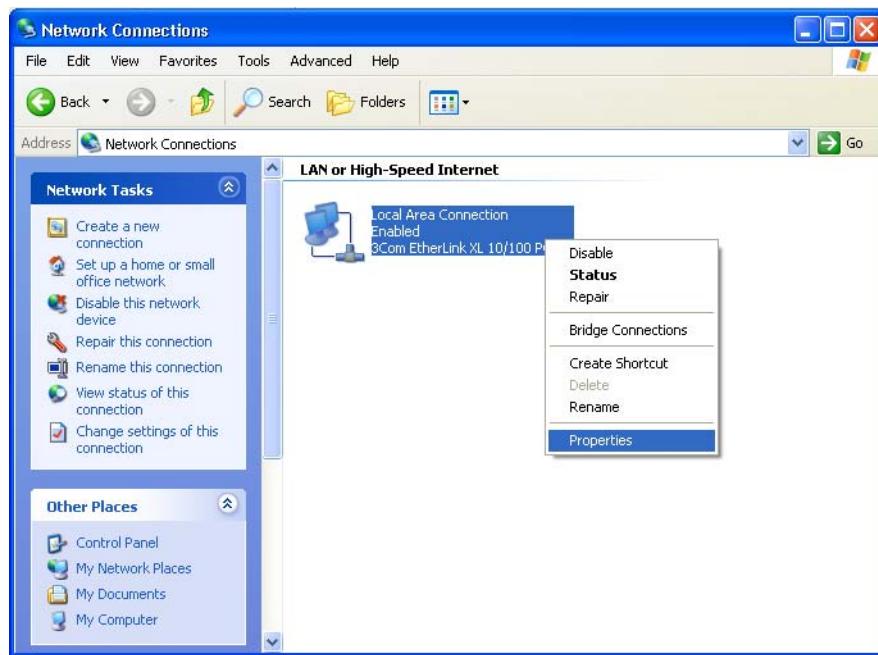
- 3 Click **Network and Internet Connections**. The Network and Internet Connections window is displayed:



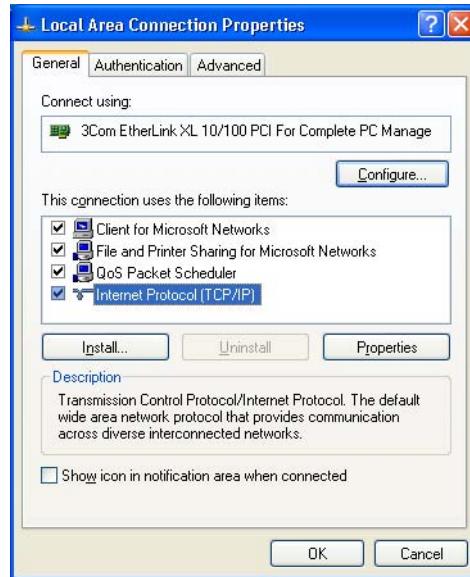
- 4 On the Network and Internet Connections window, click **Network Connections** to display the LAN or high-speed Internet connections. Skip to step 6.
- 5 If a *Classic* view similar to below is displayed, click **Network Connections** to display the LAN or high-speed Internet connections.



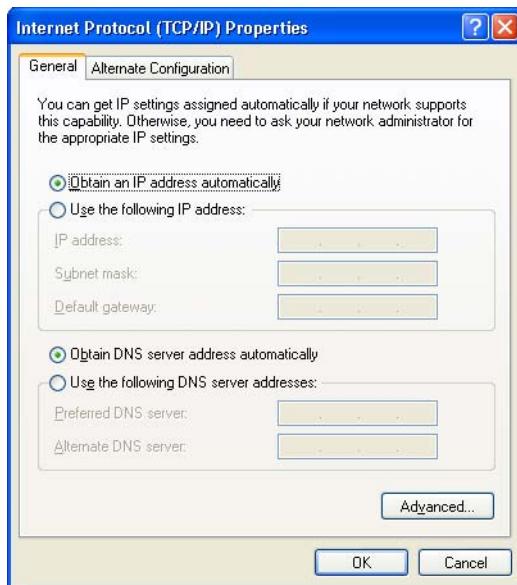
- 6 Right-click your network connection. If more than one connection is displayed, be sure to select the one for your network interface.



- 7 Select **Properties** from the pop-up menu. The Local Area Connection Properties window is displayed:



- 8 Select **Internet Protocol (TCP/IP)** and click **Properties** to display the Internet Protocol (TCP/IP) Properties window:



9 On the Internet Protocol (TCP/IP) Properties window, verify that the settings are correct, as shown.

10 Click **OK** to close the TCP/IP Properties window.

11 Click **OK** to close the Local Area Connection Properties window.

When you complete the TCP/IP configuration, go to "[Verifying the IP Address in Windows 2000 or Windows XP](#)" on page 25.

Verifying the IP Address

The following subsections describe verifying an IP address. Perform the appropriate procedure for your Windows version:

- "Verifying the IP Address in Windows 2000 or Windows XP" on page 25
- **Windows Vista users, to obtain the TCP/IP configuration and verification, please consult help system.**

For a Macintosh or UNIX system, refer to your user guide.

Verifying the IP Address in Windows 2000 or Windows XP

To check the IP address:

- 1 On the Windows Desktop, click **Start**.
- 2 Select **Run**. The Run window is displayed.
- 3 Type **cmd** and click **OK**.
- 4 Type **ipconfig** and press **ENTER** to display your IP configuration. A display, like below, indicates a normal configuration:

```
C:\>ipconfig
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig
Windows 2000 IP Configuration

Ethernet adapter Local Area Connection 2:
      Connection-specific DNS Suffix . : surfboard.com
      IP Address . . . . . : 206.19.86.174
      Subnet Mask . . . . . : 255.255.255.224
      Default Gateway . . . . . : 206.19.86.161

Ethernet adapter Local Area Connection:
      Media State . . . . . : Cable Disconnected

C:\>
```

If an Autoconfiguration IP Address is displayed as in the window below, there is an incorrect connection between your PC and the digital voice modem or there are cable network problems.

```
C:\>ipconfig
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig
Windows 2000 IP Configuration

Ethernet adapter Local Area Connection 2:
      Connection-specific DNS Suffix . . .
      Autoconfiguration IP Address. . . . . : 169.254.45.20
      Subnet Mask . . . . . : 255.255.0.0
      Default Gateway . . . . . :

C:\>
```

Check:

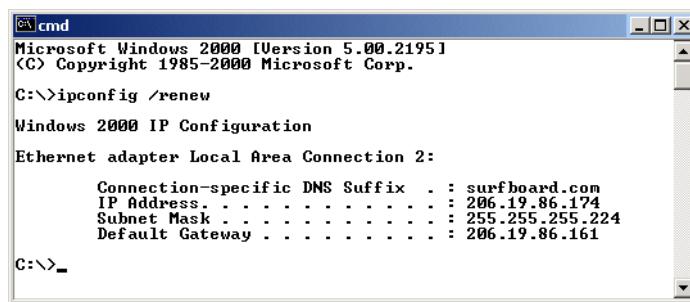
- Your cable connections
- Whether you can see cable-TV channels on your television

After successfully verifying your cable connections and proper cable-TV operation, you can renew your IP address.

Renewing Your IP Address

To renew your IP address:

- 1** On the Windows Desktop, click **Start**.
- 2** Select **Run**. The Run window is displayed.
- 3** Type **cmd** and click **OK**.
- 4** Type **ipconfig /renew** and press **ENTER**. If a valid IP address is displayed as shown, Internet access should be available.



```
cmd
Microsoft Windows 2000 [Version 5.00.2195]
(C) Copyright 1985-2000 Microsoft Corp.

C:\>ipconfig /renew

Windows 2000 IP Configuration

Ethernet adapter Local Area Connection 2:

  Connection-specific DNS Suffix . : surfboard.com
  IP Address . . . . . : 206.19.86.174
  Subnet Mask . . . . . : 255.255.255.224
  Default Gateway . . . . . : 206.19.86.161

C:\>_
```

- 5** Type **exit** and press **ENTER** to return to Windows.

If after performing this procedure your computer cannot access the Internet, call your cable provider for help.

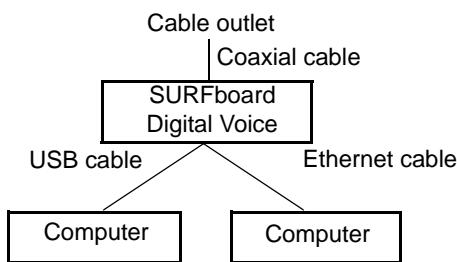
Cabling for Multiple Users

The SURFboard Digital Voice Modem supports several multiple-user configurations. Along with an optional hub or router, it can serve as an Internet gateway for up to 31 computers.

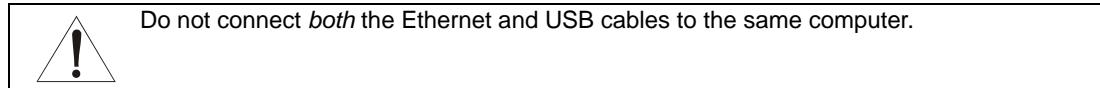
Not all service providers support multiple-user service. For information about multiple-user service, contact your cable provider.

Ethernet and USB

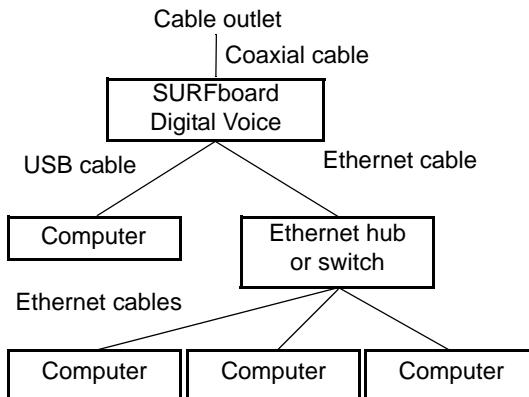
You can connect the USB port on one computer and the Ethernet port on another computer directly to the digital voice modem, as shown.



Caution

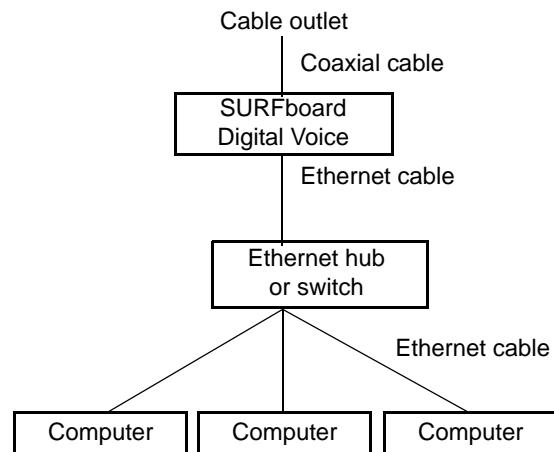


You can connect a single computer to the USB port and from one to 31 remaining users to an Ethernet hub, as shown. You cannot connect more than one computer to the digital voice modem through the USB port.



Ethernet

You can connect up to 31 computers to an Ethernet hub connected to a SBV5222 digital voice modem, as shown.



Wall Mounting the SBV5222

If you mount your SBV5222 on the wall, you must:

- Locate the unit as specified by the local or national codes governing residential or business cable TV and communications services.
- Follow all local standards for installing a network interface unit/network interface device (NIU/NID).

If possible, mount the SBV5222 to concrete, masonry, a wooden stud, or other very solid wall material. Use anchors if necessary, for example, if you must mount the unit on drywall.

To mount your SBV5222 on the wall:

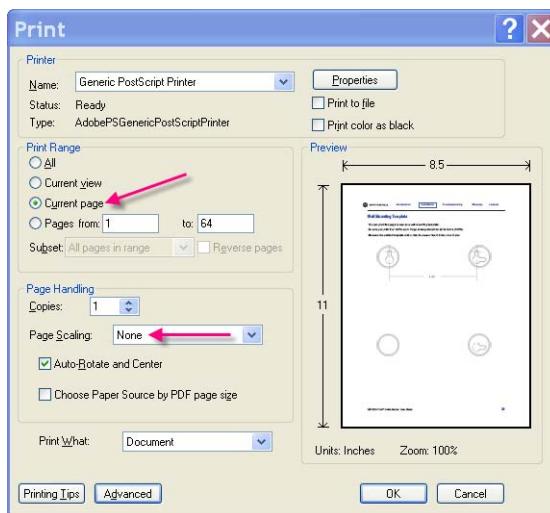
- 1 If present, remove the four rubber chassis feet on the bottom of the SBV5222 as indicated.



- 2 Print the Wall Mounting Template on page 31.

While viewing the Wall Mounting Template, click the Print icon or choose Print from the File menu to display the Print dialog box. (The following image is from Adobe® Acrobat® Reader® running on Windows XP; there may be slight differences in your version).

Under Print Range, select Current page. Be sure you print the template at 100% scale. Page scaling should be set to None (100%). Click OK to print the template.



- 3 Measure the printed template with a ruler to ensure that it is the correct size.
- 4 Use a center punch to mark the center of the holes.
- 5 On the wall, locate the marks for the mounting holes.

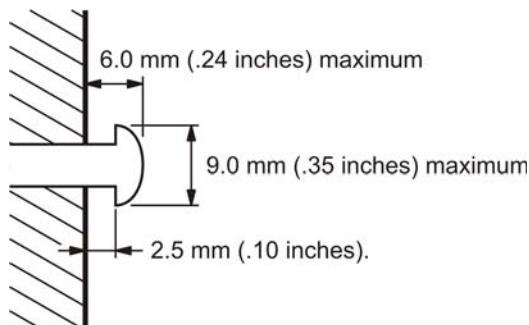
Caution

Before drilling holes, check the structure for potential damage to water, gas, or electric lines.

- 6 See step 6 for recommended mounting hardware size. Drill holes to a depth and diameter appropriate for the size and type of hardware you have selected.
- 7 If necessary, install an anchor in each hole.

Use M3.5 x 38 mm (#6 x 1 1/2 inch) screws with a flat underside and maximum screw head diameter of 9.0 mm (.35 inches) to mount the SBV5222.

- 8 Using a screwdriver, turn each screw until the head protrudes from the wall, as shown:
 - There must be at least 2.5 mm (.10 inches) between the wall and the underside of the screw head.
 - The maximum distance from the wall to the top of the screw head is 6.0 mm (.24 in)



Note: Example above for mounting SBV5222 on a wood surface.

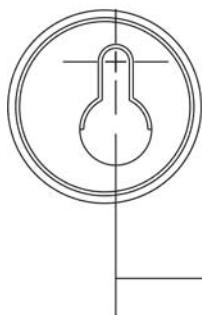
- 9 Place the SBV5222 so the keyholes are above the mounting screws.
- 10 Slide the SBV5222 down so it stops against the top of the keyhole opening.

Wall Mounting Template

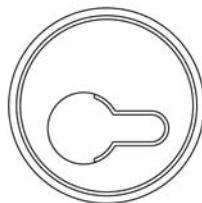
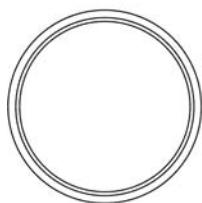
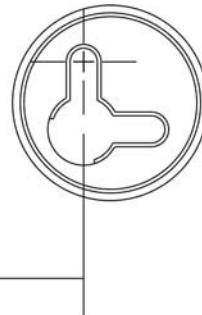
You can print this page to use as a wall mounting template.

Be sure you print it at 100% scale. Page scaling should be set to None (100%).

Measure the printed template with a ruler to ensure that it is the correct size



4.00"



► Troubleshooting

If the solutions listed here do not solve your problem, contact your cable provider. Before calling your service provider, try pressing the reset button on the rear panel or unplugging and plugging in the digital voice modem power cord. Resetting the digital voice modem may take 5 to 30 minutes. Your service provider may ask for the status of the front-panel lights as described in "Front-Panel Lights and Error Conditions" on page 33.

Problem	Possible Solutions
Green POWER light is off	<ul style="list-style-type: none">Check that the power cord is properly plugged into the electrical outlet and the digital voice modem.Check that the electrical outlet is working.If the Standby light is on, the Internet connection is off. Press the Standby button to reconnect to the Internet.
No telephone service	<ul style="list-style-type: none">Check the connection between the SBV5222 and your telephone.If your telephone requires external power, check the AC power connection for your telephone.Check the coaxial cable on the SBV5222 and the electrical outlet. Hand-tighten the cable connectors if necessary.Check the lights on the front panel. Make sure the green power light is on. If it is not, check that the power cord is properly plugged into the electrical outlet and the digital voice modem.If you have cable TV, check that your TV is working and the picture is clear. If you cannot receive your regular TV channels, your telephone service will not function.
Cannot send or receive data	<ul style="list-style-type: none">Check the lights on the front panel. Note the first light from top to bottom that is off. This light indicates where the error occurred, as described in "Front-Panel Lights and Error Conditions" on page 33.If all lights are off except the Standby and Tel 1/Tel 2 lights, the digital voice modem is in Standby mode. Press the Standby button to reconnect your Internet service.If you have cable TV, check that your TV is working and the picture is clear. If you cannot receive your regular TV channels, your data service will not function.Check the coaxial cable on the SBV5222 and the electrical outlet. Hand-tighten the cable connectors if necessary.Check the IP address. Follow the steps in "Verifying the IP Address in Windows 2000 or Windows XP" on page 25. Call your cable provider if you need an IP address.Check that the USB or Ethernet cable is properly connected to the digital voice modem and your computer.
Problems related to unsuccessful USB driver installation	<p>Remove the USB driver. Follow the instructions in one of:</p> <ul style="list-style-type: none">"Removing the USB Driver from Windows 2000" on page 34"Removing the USB Driver from Windows XP" on page 36 <p>Then perform "Contact Us" on page 39.</p>

Front-Panel Lights and Error Conditions

Light	Turns Off During Startup If	Turns Off During Normal Operation If
Power	The digital voice modem is not properly plugged into the power outlet	The digital voice modem is unplugged or is in standby mode.
Battery	AC power is not present.	AC power is not present.
DS (Receive)	The receive channel cannot be acquired	The receive channel is lost
US (Send)	The send channel cannot be acquired	The send channel is lost
Online	IP registration is unsuccessful	The IP registration is lost
Tel 1 or Tel 2	If the Tel light fails to flash during startup, telephone line configuration has failed.	Connected during a phone call and does not blink, telephone connection is lost.

If a telephone line is properly connected and the Tel 1 or Tel 2 light remains off, the line has not been set up for service. Contact your service provider.

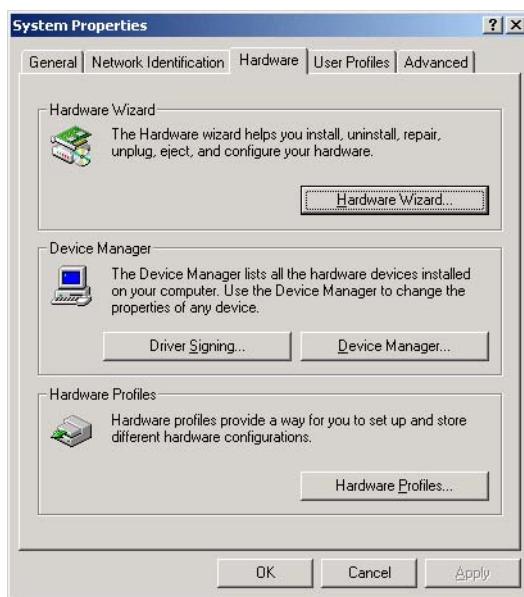
For more information about the lights, see “[Top and Front Panel](#)” on page 3.

Removing the USB Driver from Windows 2000

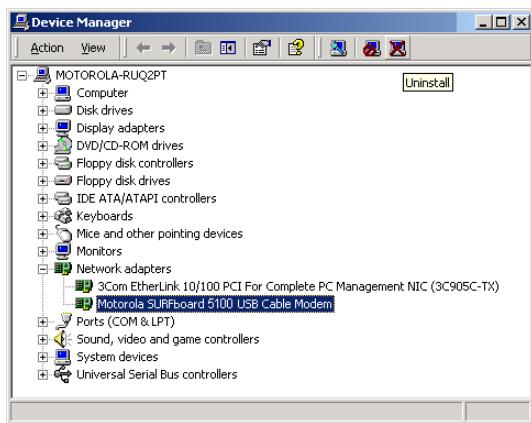
- 1 On your Windows desktop, click **Start**.
- 2 Click **Settings**.
- 3 Double-click **Control Panel** to display the Control Panel window:



- 4 Double-click **System** to display the System Properties window.
- 5 Click the **Hardware** tab:



- 6** Click **Device Manager** to display the Device Manager window:

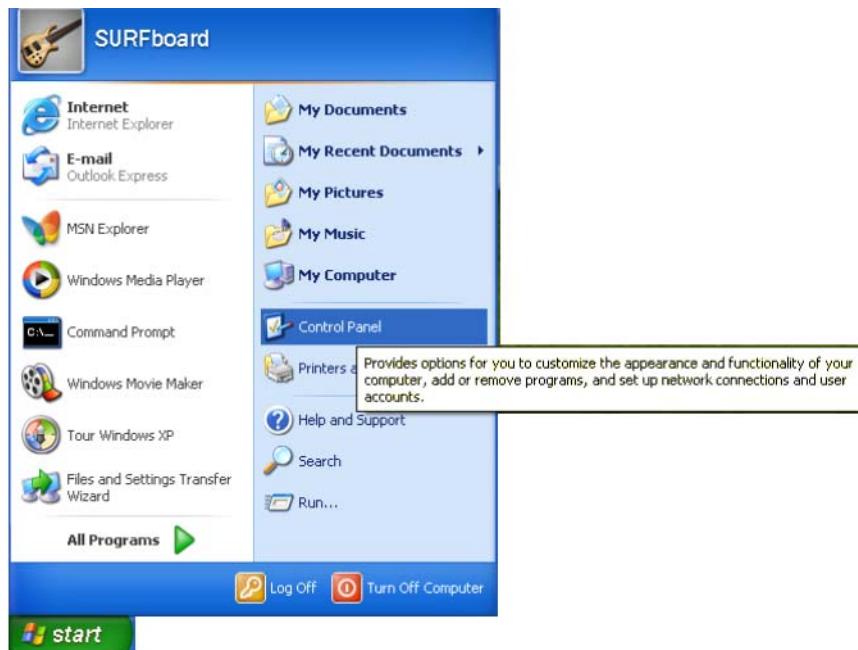


Although your SURFboard Digital Voice Modem model number may be different than in the images in this guide, the procedure is the same.

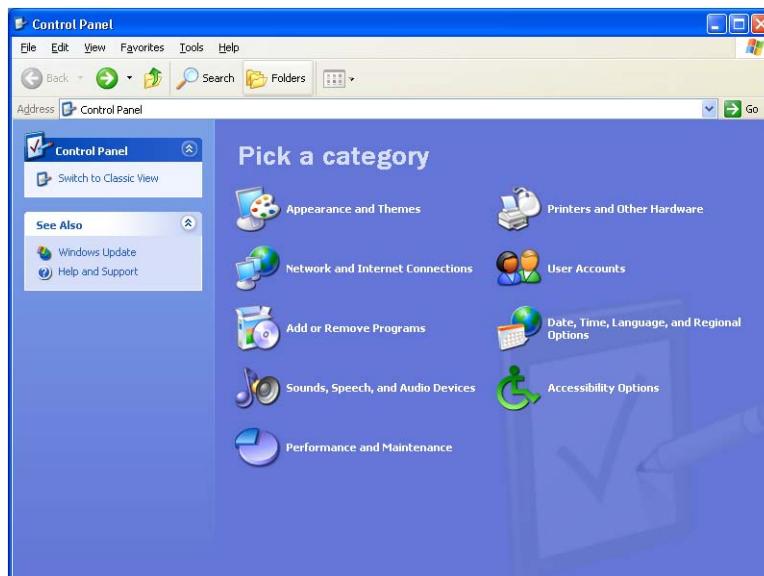
- 7** Double-click **Network Adapters**.
- 8** Click the **Motorola SURFboard USB Cable Modem**. The Uninstall icon is displayed on the window near the top.
- 9** Click **Uninstall**. A window is displayed.
- 10** Click **OK**.
- 11** Close the Device Manager and Control Panel windows.
- 12** Perform “[Contact Us](#)” on page 39.

Removing the USB Driver from Windows XP

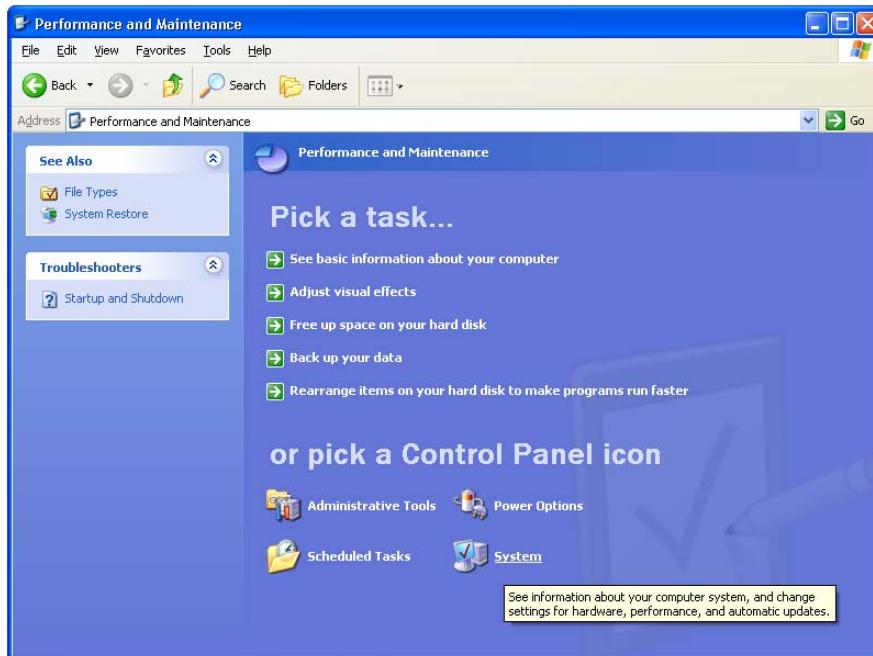
- 1 On the Windows desktop, click **Start** to display the Start window shown.



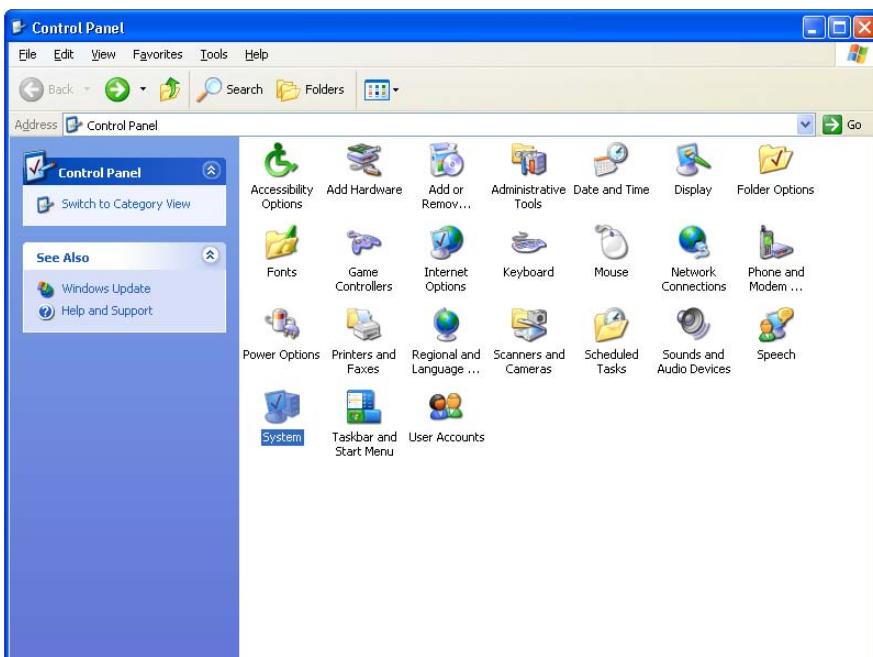
- 2 Click **Control Panel** to display the Control Panel window. The display varies, depending on your Windows XP view options.



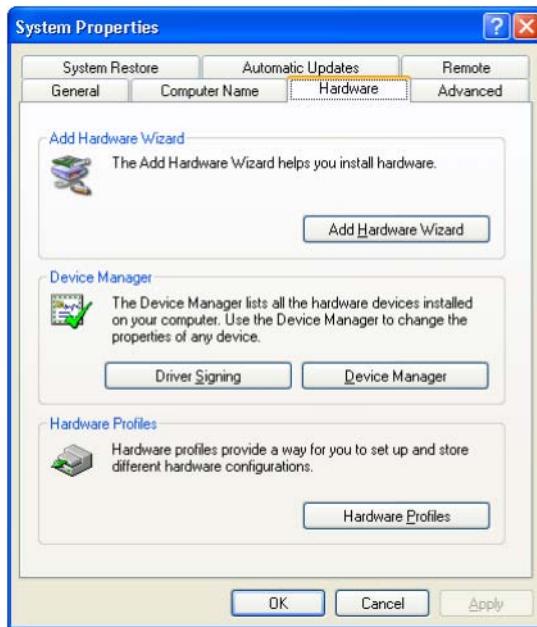
- 3 If a **Category** view similar to the image under step 2 is displayed, click **Performance and Maintenance**. Otherwise, skip to step 5.



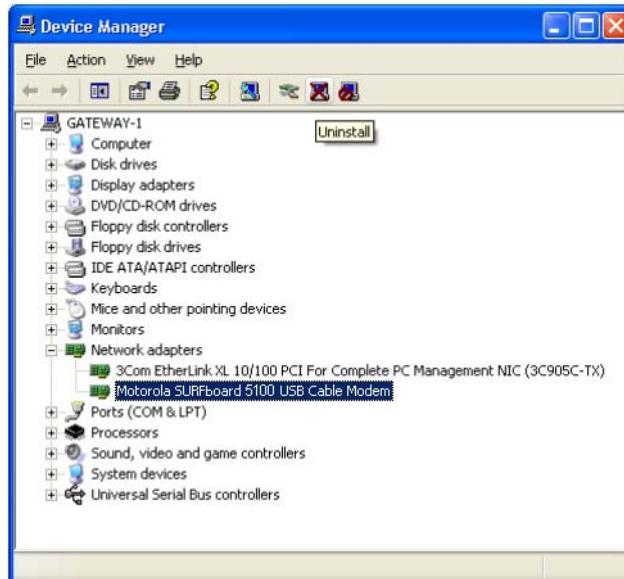
- 4 Click **System** to display the System Properties window. Skip to step 6.
5 If a **Classic** view similar to the following is displayed, click **System** to display the System Properties window:



- 6 Click the **Hardware** tab to display the Hardware page:



- 7 Click **Device Manager** to display the Device Manager window:



Although your SURFboard Digital Voice Modem model number may be different than in the images in this guide, the procedure is the same.

- 8 Double-click **Network adapters**.
- 9 Click the **Motorola SURFboard USB Cable Modem**. The Uninstall icon is displayed on the window near the top. Click **Uninstall**.
- 10 Close the Device Manager window and Control Panel windows.

Contact Us

If you need assistance while working with the SURFboard Digital Voice Modem, contact your cable provider. For more information about customer service, technical support, or warranty claims, see the *Regulatory, Safety, Software License, and Warranty Information* card provided with the SURFboard Digital Voice Modem.

For information about Motorola consumer cable products, education, and support, visit www.motorola.com.

Frequently Asked Questions

Q What is high-speed cable Internet access?

A Cable Internet access uses cable television wires instead of telephone lines to connect to the Internet. It is extremely fast and affordable and does not tie up telephone lines for incoming or outgoing calls and faxes.

Q What is voice over Internet Protocol (VoIP)?

A VoIP uses cable television wires instead of traditional telephone lines to provide voice and fax service.

Q How fast is a digital voice modem?

A A cable modem offers Internet access at speeds up to 100 times faster than a traditional phone modem. You can experience speeds of over 1,000 Kbps. Network conditions such as traffic volume and the speed of the sites you visit can affect download speeds.

Q Can I still watch cable TV while using my digital voice modem?

A Yes, your cable TV line can carry the TV signal while you send and receive information on the Internet.

Q What are CableLabs® Certified, DOCSIS®, and Euro-DOCSIS?

A CableLabs Certified, DOCSIS, and Euro-DOCSIS are the industry standards for high-speed data distribution over cable television system networks. They are intended to ensure that all compliant digital voice modems interface with all compliant cable systems. Your Motorola SBV5222 digital voice modem is DOCSIS-, or Euro-DOCSIS certified.

Q What is PacketCable?

A PacketCable™ is an evolving set of interface specifications for delivering advanced, real-time multimedia services over cable; for example, VoIP, multimedia conferencing, and interactive gaming.

Q If I have a digital voice modem, can I still use my old 28.8 Kbps or 56 Kbps modem?

A Yes! Although once you've experienced the speed of cable Internet access, you'll never again want to wait for traditional dial-up services.

Q I have more than one computer. Do I need more than one SURFboard Digital Voice Modem?

A No, not if your computers are connected on a network. The SURFboard Digital Voice Modem supports current Internet connection sharing technologies to enable you to connect up to 31 computers to the Internet using a single digital voice modem.

Q Do I need to change my Internet service provider (ISP)?

A A broadband connection is required for high-speed Internet access and VoIP telephone service available with your SBV5222. Contact your cable company for your specific information.

Q Do I need to subscribe to cable TV to get cable Internet access?

A No, but you will need to subscribe to cable Internet service. Some systems require that you subscribe to basic service before you can get Internet access and/or offer a discount when you use your own digital voice modem. Check with your local cable company for specific information.

Q What type of technical support is available?

A For questions about your Internet service, connection, or digital voice modem, contact your cable provider.

Q What do I do if my SURFboard Digital Voice Modem stops working?

A "Troubleshooting" on page 32 provides tips to diagnose problems and simple solutions. If you continue to have problems, contact your cable provider or Motorola as described in "[Contact Us](#)" on page 39.

❖ Glossary

coaxial cable (coax)	A type of wire consisting of a center wire surrounded by insulation and a grounded shield of braided wire. The shield minimizes electrical and radio frequency interference.
DOCSIS	The CableLabs Data-Over-Cable Service Interface Specification defines interface standards for cable modems and supporting equipment.
download	To copy a file from one computer to another. You can use the Internet to download files from a server to your home PC. A DOCSIS digital voice modem downloads its configuration from a server during start-up.
downstream	In a network, downstream describes the direction of data received by your computer from the Internet.
Ethernet	The most widely used type of local area network (LAN). The most commonly installed Ethernet networks are called 10Base-T. 10Base-T provides transmission speeds up to 10 megabits per second (Mbps), usually over twisted-pair wire. Fast Ethernet (100Base-T) provides transmission speeds up to 100 Mbps.
expansion slot	An opening in a computer where a circuit board can be inserted to add new capabilities.
F-type connector	A connector used to connect coaxial cable to equipment.
IP address	An Internet Protocol address is an identifier for a computer or device on a TCP/IP network. Networks using TCP/IP route messages based on the destination IP address. Your cable provider assigns your digital voice modem an IP address to provide a continuous Internet connection.
MAC address	The Media Access Control Address uniquely identifies each device that can be connected to an Ethernet network. It is permanently written to read-only memory (ROM) at the factory and printed on the rear panel of your SURFboard Digital Voice Modem. You need to provide the MAC address to your cable provider.
MHz	Mega Hertz. A measure of frequency - millions of cycles per second. One MHz means one million cycles per second.
PBX	A private branch exchange is a private telephone network usually used within a business. Users of the PBX share a certain number of outside lines for making telephone calls external to the PBX.
PSTN	The public switched telephone network is the traditional circuit-switched, voice-oriented telephone network originally invented by Alexander Graham Bell. It is sometimes referred to as plain old telephone service (POTS).
RJ-11	The most common type of connector for household phones.
RJ-45	The most common type of connector for Ethernet networks.
splitter	A splitter is a device that divides the signal power from an input cable equally between two or more signals, each carrying a selected frequency range.
TCP/IP	Transmission Control Protocol/Internet Protocol is a set of standards and rules for communication between networks.
upstream	In a network, upstream describes the direction of data sent from your computer to the Internet.
UPS	An uninterruptible power supply provides a battery backup to enable voice service to continue for some time during a power outage.
USB	Universal Serial Bus is a computer interface for add-on devices such as printers, scanners, and digital voice modems. When you connect your SURFboard Digital Voice Modem to the USB port, Windows 98 Second Edition and later versions automatically recognize the digital voice modem.
VoIP	Voice over Internet Protocol is a method to exchange voice, fax, and other information over the Internet. Voice and fax have traditionally been carried over traditional telephone lines using a dedicated circuit for each line. VoIP enables calls to travel as discrete data packets on shared lines.

Software License

SBV5222 Digital Voice Modem

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